

**CDM**

# **Comparison of GHG Emissions Inventories with Different Reporting Protocols**

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# Introduction

- ◆ Potential for conflicting standards between different protocols – issue for companies with nationwide facilities
- ◆ Mandatory versus voluntary reporting standards
- ◆ Effects on hypothetical facility evaluated

# Reporting Protocols

- ◆ California Global Warming Solutions Act of 2006 (AB 32)
- ◆ California Climate Action Registry (CCAR)
- ◆ The Climate Registry (TCR)
- ◆ Clean Air Climate Protection Software (CACPS)

## **AB 32**

- ◆ **Mandatory reporting regulation**
  - ◆ **December 5, 2007 version**
  - ◆ **Revised version released after paper prepared**
- ◆ **Specific Industries**
- ◆ **General stationary combustion sources with CO<sub>2</sub> emissions greater than or equal to 25,000 tonnes**
- ◆ **Reporting on facility-by-facility basis**

# **California Climate Action Registry (CCAR)**

- ◆ **Voluntary reporting registry**
- ◆ **Entity-wide emissions**
  - ◆ **Operational control**
  - ◆ **Equity share**
- ◆ **California-only or nationwide inventories**
- ◆ **Provided input on development of AB 32 mandatory reporting regulation**

# **The Climate Registry (TCR)**

- ◆ **Voluntary Reporting Registry**
- ◆ **US States, Canadian Provinces, Mexican States, and Tribal Nations**
- ◆ **Existing registries likely to transition into reporting for TCR**
- ◆ **Coordination with CCAR in development of protocols**

# **Clean Air Climate Protection Software (CACPS)**

- ◆ **Product of ICLEI – Local Governments for Sustainability and the National Association of Clean Air Agencies (NACAA)**
- ◆ **Intended to be used to states and localities**
- ◆ **Evaluates emission reduction techniques**

# Pollutants Reviewed

- ◆ Carbon dioxide (CO<sub>2</sub>)
- ◆ Methane (CH<sub>4</sub>)
- ◆ Nitrous Oxide (N<sub>2</sub>O)
- ◆ Other Kyoto pollutants (PFCs, HFCs, SF<sub>6</sub>) not reviewed
- ◆ AB 32 minimum requirements
- ◆ Not all facilities have all pollutants



# Fuels Reviewed

- ◆ Purchased electricity (50,000 kWh)
- ◆ Gasoline (20 gal)
- ◆ Diesel (1,000 gal)
- ◆ Natural gas (25,000 therms)
- ◆ Propane (2,000 gal)
- ◆ Stationary sources only

# Method

- ◆ Default emission factors only
- ◆ Global warming potential (GWP) values from 1996 IPCC Second Assessment Report (SAR)
- ◆ Possible future variations
  - ◆ Higher heating values
  - ◆ Carbon content
  - ◆ CEMS data

# **Purchased Electricity**

- ◆ **Emission factors from the Emissions & Generation Resource Integrated Database (eGRID) – 2004**
- ◆ **AB 32 does not require direct reporting of purchased electricity**
  - ◆ **Retail provider name**
  - ◆ **Annual usage**
- ◆ **AB 32 emission factor calculated from data received from retail providers in an internal database and assigned to facilities**

# Stationary Combustion

- ◆ Default emission factors
- ◆ Conversion from mmBTU to gallons may be required for CH<sub>4</sub> and N<sub>2</sub>O emission factors
- ◆ Does not take into account variability of fuel (HHV and carbon content)

# CACP Software

- ◆ Community analysis
- ◆ No changes to default emission factors
- ◆ Facility assumed to be located in California

# Results

- ◆ No difference between AB 32, CCAR, and TCR for default emission factors!
  - ◆ In reality, AB 32 will have different emissions for electricity
  - ◆ Derived emission factors & source test data
  - ◆ Equity share versus facility-level reporting
- ◆ Tight integration of reporting protocol development between organizations

## **Results (cont'd)**

- ◆ **CACPS showed 4% difference in emissions**
- ◆ **Difference between city emission reduction goals (calculated with ICLEI) and AB 32 reporting requirements**
- ◆ **Different carbon footprints = difference carbon liabilities**
  - ◆ **How many offsets need to be purchased?**
  - ◆ **Cap-and-trade implications?**
  - ◆ **Faith in inventories?**

# Results

## ◆ Table of Results

Source	CO2e Emissions, tonnes	
	CCAR	CACPS
Electricity	20	19
Gasoline	0	0
Diesel	10	10
Natural Gas	133	140
Propane	12	13
Total	175	182



# Conclusions

- ◆ **Strong correlation between reporting programs for default emission factors**
- ◆ **Additional reviews needed!**
  - ◆ **Equity share vs facility-level**
  - ◆ **Carbon content and higher heating value**
- ◆ **Be consistent with method chosen throughout all reporting protocols**